

Application No. 09/740,209

REMARKS

In a Final Office Action dated April 5, 2004, claims 1-7, 9-11, 14-17 and 19 were rejected under 35 U.S.C. 102(b) as either being anticipated by Khuri-Yakub (U.S. Patent 5028937) or obvious under 35 U.S.C. 103 over Khuri in view of Sweet 426 and Biegelsen 6,136,210. In the rejection, the Examiner agreed with Applicant's arguments that Sweet and Khuri do not disclose a pharmaceutical product. However, The Examiner maintained that the fact was irrelevant because the pharmaceutical product was not positively recited. In response, Applicant has amended the independent claims 11 and 12 to positively recite the pharmaceutical product.

In addition, Applicant respectfully submits that the limitation of pulses that are of short duration and low frequency such that droplets are output by capillary action is a limitation not shown in the prior art references. Khuri describes using capillary action to cause ink menisci to extend across each of the apertures at approximately the same level. (Khuri Col. 2, lines 41-45). The Khuri described capillary action merely spreads the liquid, it is not an action where a principle mound receives insufficient energy to eject a droplet but instead causes surrounding wave crests to eject a droplet. Such a capillary action is described in Applicant's specification page 4 to page 5 and shown in Figure 2.

In fact, Applicant respectfully submits that it is inappropriate to use capillary action to print in an ink printing systems because it is much more difficult to formulate the exact position where the droplet will be ejected. Exact positioning is not as important when distributing pharmaceutical product into an airstream for inhalation.

As pointed out on page 5, use of capillary actions allows lower frequencies to be used to create smaller droplets. In particular the diameter of capillary generated droplets is similar to the magnitude of the wavelengths of the capillary waves. Thus, Applicant has added new dependent claim 20 that claims the diameter of the capillary generated droplets is within 10x the wavelength of the capillary waves.

In addition, the Office Action ruled claim 9 as obvious in view of the Takayama (U.S. Patent 5,912,679). Takayama does not use capillary action. Thus the 10MHz frequency of Takayama results in a 200 micrometer ink droplet. (Takayama Col 16,

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lines 60-63). This is much larger than the approximately 5 micrometer droplets produced by 1.5 micrometer wave crests generated by a 10 MHz signal as specified in Applicant's specification (page 5). (In fact the 5 micrometer to 200 micrometer difference at 10 MHz is very close to the two orders of magnitude reduction from the 200 micrometer ink droplet in Tanaka as predicted in the first paragraph on page 5 of Applicant's specification). Thus Applicant has further amended claim 9 to indicate the small droplet sizes that result from the capillary action and respectfully submits that such droplets are neither disclosed nor suggested by the prior art.

Applicant respectfully submits that a prima facie case of obviousness has not been made with respect to claim 10 because Takayama does not disclose a droplet less than 10 micrometers in diameter, much less a less than 10 micrometer droplet produced by a less than 15 MHz signal.

Applicant also respectfully submits that a prima facie case of obviousness has not been made with respect to claim 19 added in the last office action response. No discussion of claim 19 is made in the Final Office Action.

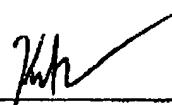
With respect to claims 14-17, it is acknowledged in the Final Office Action that the distance from the lens to the surface of the ink is not disclosed in any of the prior art references. However, the distance was still ruled obvious. Applicant respectfully disagrees. The distance was ruled obvious because Sweet discloses that the distance from the lens of the fluid surface is adjustable and that the smaller the distance, the larger the droplet produced. It was argued that large droplets may be desirable to make a larger print. However, such large droplets are unsuitable for an inhalation mechanism. In fact, as described at the top of page 4 of the specification, high frequencies are used to generate small droplets. These high frequencies cause high power losses which are the reason that the distance from the top surface of the lens to the free surface of the pharmaceutical product is reduced. Thus Applicant respectfully submits that claims 14-17 are not described in the prior art because the distance claimed is not described in the prior art, and the motivation to move to that distance is invalid because it would produce the opposite result of what is desired.

In addition, Applicant has added dependent claims claiming small droplet sizes and high frequencies used.

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In view of the preceding amendments and remarks, Applicant respectfully submits that the claims as amended are allowable over the cited prior art reference, and allowance at Examiner's earliest convenience is hereby respectfully requested. In the event that the Examiner believes a teleconference would facilitate prosecution, Applicant respectfully requests that Examiner contact the undersigned.

Respectfully submitted,



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